

## REMARKS

Reconsideration of the application, as amended, is respectfully requested.

### I. STATUS OF CLAIMS

Claims 1-25 are pending in this application. Claims 1 and 19 have been amended to further clarify that the thermal barrier coating system is completely removed during step b) of the method recited in these claims. Claim 25 has been amended to further clarify that the thermal barrier coating system is completely removed during step c) of the method recited in this claim.

It is respectfully submitted that no new matter has been added by virtue of this amendment. Support for the above amendments may be found throughout the specification as originally filed. In particular, support for the amendments made to claims 1, 19 and 25 may be found on page 12 , lines 15-21 of the present specification.

### II. 35 U.S.C. 103(a) REJECTIONS

The Examiner rejected claims 1-6 and 9-25 under 35 U.S.C. 103 (a) as being unpatentable over U.S. Patent No. 5,972,424 to Draghi et al (“ the Draghi patent”) in view of U.S. Patent No. 6,049,978 to Arnold (“the Arnold patent”) and U.S. Patent No. 5,851,409 to Schaeffer et al. (“the Schaeffer patent”).

Initially, as noted above, claims 1 and 19 have been amended to further clarify that the thermal barrier coating system is completely removed during step b) of the method recited in these claims. Claim 25 has been amended to further clarify that the thermal barrier coating system is completely removed during step c) of the method recited in this claim.

It is respectfully asserted that the above proposed combination fails to teach or suggest all of the limitations recited in amended independent claims 1, 19 and 25. At the very least, the

above proposed combination fails to teach or suggest providing a method for repairing coated components, exposed to engine operation wherein the thermal barrier coating system, comprising a bond coat and top ceramic thermal barrier coating is completely removed from the component during the repair process, as recited in step b) of amended claims 1 and 19 and step c) of amended claim 25.

In the Office Action, The Draghi patent was cited by the Examiner as teaching all of the features of the presently claimed invention except for the details of the types of materials used for repair. The Arnold patent was cited by the Examiner as a secondary teaching that during repair of gas turbine engine foils, the repair engineer must determine the difference between pre-repaired dimensions of the part and the desired post repair dimensions. Further, the Schaeffer patent was cited by the Examiner for teaching use of nickel-aluminide beta phase (NiAl) as a bond coat replacement material.

Besides those deficiencies mentioned above by the Examiner, the Draghi patent also fails to teach or suggest providing a method for repairing coated components, exposed to engine operation wherein the thermal barrier coating system, comprising a bond coat and top ceramic thermal barrier coating is completely removed from the component during the repair process, as recited in step b) of amended claims 1 and 19 and step c) of amended claim 25. Instead, the Draghi patent teaches away from processes which completely remove the thermal barrier coating system, including the bond coat from a component which is to be repaired.

In particular, the Draghi patent teaches that in its method only the ceramic top coat 16 and the aluminum oxide layer 14 of its thermal barrier coating system 10 should be removed from the engine run gas turbine engine component, but that the original bond coat 12 should not be removed the component or at the very least a sufficient amount of the original bond coat 12, e.g. about 1 mils of the original bond coat, must not be removed from the component, in order to be able to practice its invention. Next, the Draghi patent teaches that after the removal of the ceramic top coat 16 and aluminum oxide layer 14 during its repair process, a flash coat is then applied over the original bond coat 12 on the gas turbine component, followed by application of both a new aluminum oxide layer and a new ceramic top coat over the flash coat.

Applicants wish to point out that the Draghi patent clearly indicates the critical importance of not removing the entire original bond coat 12 from the gas turbine engine component in practicing its invention, by expressly stating in its patent that if there is insufficient original bond coat 12 left on the gas turbine engine component after removal of the ceramic top coat 16 and the aluminum oxide layer 14 that its method cannot be used in repairing the component. (See Col. 4, lines 24-28 of the Draghi patent)

Moreover, the Draghi patent further mentions in the background section of its patent that there are several specific drawbacks in removing the entire thermal barrier coating system, including the bond coat from a gas turbine engine component during a repair process. (See Col.2, lines, 16-20 of the Draghi patent). In particular, Draghi patent states that by removing and reapplying a metallic bond coat of a thermal barrier coating system to and from a component during a repair process, the following drawbacks can result: (i) a problem known as “coat down”, (ii) a repair process that is expensive and time consuming and (iii) a repair process that generates waste material or by products that require costly disposal. (See Col.2, lines, 20-33 of the Draghi patent).

As can be gleaned from the above, the Draghi patent clearly teaches away from completely removing the thermal barrier coating system from a gas turbine engine component during its repair process. Consequently, one skilled in the art using the discussed teaching of the primary reference (i.e. the Draghi patent) in combination with the Arnold and the Schaeffer patents as proposed in above rejection, would arrive at a method of repairing a coated gas turbine engine component, which required that at least about 1 mils of the original bond coat 12 not be removed from the component throughout the whole repair process. Thus, this proposed combination would at the very least fail to teach or suggest providing a method for repairing coated components, exposed to engine operation wherein the thermal barrier coating system, comprising a bond coat and top ceramic thermal barrier coating is completely removed from the component during the repair process, as recited in step b) of amended claims 1 and 19 and step c) of amended claim 25.

Additional support for the assertion of nonobviousness of the presently claimed invention as recited in amended claim 1, 19 and 25 over the above proposed combination of Draghi, Arnold and Schaeffer patents may also be found on page 17, lines 17-22 of the present

specification which mentions how the presently claimed invention produces surprising results which are in contrast to prior teachings.

For all of the reasons set forth above, withdrawal of the above rejection to claim 1, 19 and 25 is therefore respectfully requested. As claims 2-6, 9-18 and 22-24 depend from and incorporate all of the limitations of claim 1 and claims 20-21 depend from and incorporate all of the limitations of claim 19, the withdrawal of the rejection to these dependent claims is likewise respectfully requested.

The Examiner also rejected claims 7-8 under 35 U.S.C. 103(a) as being unpatentable over the Draghi patent in view of the Arnold and Schaeffer patents as applied to claims 1-6 and 9-25 above and in further view of U.S. Patent No. 6,575,702 to Jackson ("the Jackson patent"). The Jackson patent was cited by the Examiner as teaching that a nickel based superalloy for use in turbine engine components may be made of single crystal-type or directionally solidified-type material.

However, as mentioned above with regard to amended claim 1, the combination of the Draghi, Arnold and Schaeffer patents at the very least clearly fail to teach or suggest providing a method for repairing coated components, exposed to engine operation wherein the thermal barrier coating system, comprising a bond coat and top ceramic thermal barrier coating is completely removed from the component during the repair process, as recited in step b) of amended claim 1. Further, the Jackson patent clearly fails to cure the above deficiencies of the Draghi, Arnold and Schaeffer patents. Since claims 7 and 8 depend from and incorporate all the limitations of amended claim 1, these dependent claims are likewise patentable over the proposed combination of the Draghi, Arnold, Schaeffer and Jackson patents.

For all of the reasons set forth above, claims 7-8 are also believed to be patentable.

### **III. CONCLUSION**

In view of the foregoing, it is believed that all pending claims as currently presented are in condition for allowance. A notice of allowance is respectfully requested.

According to currently recommended Patent Office policy, the Examiner is requested to contact the undersigned at the telephone number provided below in the event that a telephone interview will advance the prosecution of this application. An early and favorable action is earnestly solicited.

No fees are believed due with this amendment. However, should the undersigned attorney be mistaken regarding whether any fees are due, then please adjust deposit account no.: 50-1924, accordingly.

Respectfully submitted,

 4/21/05


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